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UNITED STATES DEPARTMENT OF AGRICULTURE

BUREAU OF ENTOMOLOGY AND PLANT QUARANTINE

NEWS LETTER

FOR OCTOBER 1938

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FRUIT INSECT INVESTIGATIONS

Insects in relation to peach mosaic.--L. D. Christenson reports that during the quarter ended September 30, the mobile laboratory operating out of San Bernardino, Calif., on the survey of the insects in peach orchards covered 3,325 miles, making 95 insect collections at 37 sampling stations in the States of Texas, Arizona, California, Colorado, Utah, Washington, and Oregon. During the 3-month period a total of 4,275 accessions were added to the survey records of the insects found on foliage, in the soil, and on the cover in peach orchards. At the fixed laboratory at Brownwood, Tex., for studies on the insect transmission of the peach mosaic disease, in cooperation with the Bureau of Plant Industry, 84 transmission tests were completed involving 8 suspects and 4,443 individual insects. Fifty-four transmission tests, involving 17 suspects, were completed at the Mareno field plots near the San Bernardino laboratory, in cooperation with the Division of Domestic Plant Quarantines, the Bureau of Plant Industry, and the California Citrus Experiment Station. Should any of the transmission tests be positive it is not expected that symptoms will appear before next spring.

Flight habits of hairy fungus beetle.--Typhaea stercorea (L.) has been found in moderate numbers in stored raisins, both on ranches and in commercial storage. During May 1938 the catches of this species taken in a rotary net, as recorded by Dwight F. Barnes and George H. Kaloostian, of the Fresno, Calif., laboratory, averaged 476 per day. The net was operated in a raisin storage yard in Fresno. The record of flight, as indicated by removal of catches at 15-minute intervals during the night of May 13-14, is given in part in the following tabulation, which agrees with subsequent short-interval work when smaller numbers were taken. The insect is on the wing most abundantly at dusk, although a few may be taken throughout the night.

Time p.m.[1]	Temperature	Relative humidity	Light	Beetles taken
	°F.	Percent	Foot candles	Number
6:45	91	35	100.00	2
7:00	90	36	45.00	8
7:15	88	40	11.00	43
7:30	88	40	1.00	155
7:45	87	40	0.25	239
8:00	85	44	0.00	132
8:15	85	44	0.00	56
8:30	85	44	0.00	46
8:45	85	44	0.00	25
9:00	85	41	0.00	2

[1] Sunset was at 6:58 p.m.

Method of emulsifying ethylene dichloride.--Oliver I. Snapp reports that the Fort Valley, Ga., laboratory has developed a simple method of emulsifying ethylene dichloride for control of the peach borer. In making a 50-percent emulsion by this new method, eight volumes of water are added to one volume of potash fish-oil soap, after which nine volumes of ethylene dichloride are added and the constituents emulsified cold by pumping. This not only simplifies the method of emulsification of ethylene dichloride but reduces the danger of a reversed or broken down emulsion when the stock mixture is prepared on the farm. A fairly quick breaking type of diluted emulsion results from this method of emulsification; therefore ethylene dichloride emulsion made by the simplified method should be used shortly after it is prepared.

High fall temperatures do not change hibernation trends of codling moth.--Continued high temperatures in the fall do not influence the pupation and emergence of codling moths. E. J. Newcomer and M. A. Yothers had an opportunity to demonstrate this recently at Yakima, Wash. Regular summer temperatures prevailed during the period September 10-24, but the number of moths caught in five baits placed in an orchard steadily decreased during this period, as shown in the following table.

Date (September)	Moths	Temperature	
		8 p.m.	Maximum
	Number	°F.	°F.
10	204	62	84
11	286	64	88
12	244	63	89
13	211	64	92
14	174	65	94
15	190	64	95
16	135	66	97
17	120	62	96
18	59	70	92
19	31	62	86
20	[illegible]	65	58
21	[illegible]	63	80
22	[illegible]	62	81
23	12	56	84
24	24	65	82

The reason for this reduction in the number of moths is evident from the following data, showing a corresponding reduction in the percentage of transforming larvae.

Date larvae left fruit	Larvae transformed
	Percent
June 11-20	99.5
June 21-30	99.4
July 1-10	95.5
July 11-20	91.0
July 21-30	90.2
July 31-August 9	61.1
August 10-19	5.3
August 20-29	0.5

Probably very few moths emerged after the end of August, and the hot weather in September did not influence larvae to pupate that had already prepared themselves for hibernation.

Standard geraniol-eugenol-phenyl ethyl alcohol bait for attracting Japanese beetles.--W. E. Fleming, E. D. Burgess, and W. W. Maines, of the Japanese beetle laboratory at Moorestown, N. J., have reported on the results of studies carried on during the summer of 1938 dealing with the effectiveness of the standard geraniol-eugenol-phenyl ethyl alcohol bait for use in Japanese beetle traps. The season's studies indicated rather clearly that geraniol is the major, if not the only, beetle attractant in the bait. The role of the eugenol seems to be primarily to stabilize the attractiveness of the geraniol, holding the initial attractiveness of the geraniol throughout the seaon, rather than to increase its attractiveness. While studies carried on a number of years earlier seemed to indicate that the phenyl ethyl alcohol increased the attractiveness of the geraniol-eugenol bait, the results of the past season's work with the grade of geraniol now in common use showed that the phenyl ethyl alcohol did not increase the attractiveness of the geraniol, but that on the contrary it tended to interfere somewhat with the stabilizing action of the eugenol. With the grade of geraniol now used in the traps, therefore, it appears that phenyl ethyl alcohol need not be used. Of the two forms of eugenol available on the market, that derived from clove oil and that derived from cinnamon oil, both types meeting the specifications for U. S. P. grade, the season's results showed that the clove eugenol was somewhat superior to cinnamon eugenol in stabilizing geraniol.

Outbreak of Ochrosidia borealis Arr. (villosa Burm.) at Weirton, W.Va.--C. H. Hadley, of the Moorestown laboratory, reports on an outbreak of grubs, thought to be those of the Japanese beetle, on the grounds of the Williams Country Club at Weirton, W. Va. An investigation of the situation was made on October 7. It was found that the infestation was general over the country club grounds covering approximately 150 acres. Infestation ranged approximately from 10 to in some cases as high as approximately 150 grubs per square foot. Grub feeding on roots of the turf was general, and in many parts of the grounds severe injury to turf was apparent. So far as could be determined, the grubs present were all O. borealis. No Japanese beetle grubs could be found. At the time of the investigation, most of the grubs were close to the surface and apparently still feeding. A small proportion of them were found at depths down to 5 to 6 inches, those apparently having started to migrate downward for hibernation. It was stated by club officials that grub injury had been observed during the last several years in increasing degree, that of the present season being by far the most extensive. For treatment, an application of acid lead arsenate at the rate of 15 pounds per 1,000 square feet, applied dry with sand as a carrier was suggested. This method of application appeared to be better adapted to the conditions obtaining than the wet application.

MEXICAN FRUITFLY CONTROL

No Mexican fruitfly apparent.--For the fourth consecutive month, no *Anastrepha ludens* Loew was trapped in the lower Rio Grande Valley of Texas. Were it not for the experience of previous years, it might be hoped that the oncoming heavy crop of citrus fruit would be free from fruitfly injury throughout the season. Experience has taught, however, that while the annual influx of flies may or may not start as early as October in every other season, some flies reach the area before the end of November. Unusually dry weather, with almost a 5-inch deficiency in rainfall, has naturally delayed growth and maturity of the citrus crop. Almost 3,000 equivalent carloads, however, have been moved to market. A few years ago this would have been 80 percent of the crop, but this season it represents approximately 8 percent.

CEREAL AND FORAGE INSECT INVESTIGATIONS

Resistance of sweet corn to European corn borer.--In tests conducted by Morris Schlosberg in 1936 and 1937 at Toledo, Ohio, of a large number of inbred sweet corn strains the entry M1828, obtained from the Michigan Agricultural Experiment Station, showed a marked inhibition to survival of European corn borer larvae, and the entry C2, obtained from the Connecticut Agricultural Experiment Station, showed approximately average survival of larvae. The results, however, pertained to specific stages of plant development when infestation occurred; therefore in 1938 the strains were similarly infested, at 22 stages of growth over a wide range of plant development, to determine whether the resistance trait in the strain M1823 persisted throughout its growth period. The resultant larval populations were adjusted for regression on stage of plant development when infestation occurred, expressed as the number of days elapsed from the date of infestation to the date of silking of the plants. The relative larval populations expected in the strains, on a per-plant basis, are shown in the tabulation below for similar conditions of infestation and plant development, at 5-day intervals. The data (see tabulation below) show a definite trend of regression of larval survival on stage of plant development when infestation occurred, and a persistent operation of the resistance trait in M1823 throughout the range of plant development considered.

Stage of plant development when infestation occurred, from infestation to silking	Resultant larvae per plant adjusted for regression on stage of plant development when infestation occurred	
	M1828	C2
Days	Number	Number
5	3.00	8.36
10	2.01	6.37
15	1.25	4.67
20	.72	3.27
25	.42	2.16
30	.36	1.35

Recovery of European corn-borer parasite.--W. G. Bradley, Toledo, Ohio, records an interesting recovery record for one of the imported parasites of the corn borer. *Eulophus viridulus* Thoms., an external chalcid attacking mature larvae and overwintering in the pupal stage, was taken during the current season from borers infesting weeds and corn in Lucas County, Ohio. While previously recovered at three points in the Lake States region during the current season of release, this is the first record of its being on a maintenance basis, no release of this species having been made in Lucas County for 7 years.

Release of corn borer parasites.--C. A. Clark, Moorestown, N. J., reports that over ten thousand adults of *Phaeogenes nigridens* Wesm., a pupal parasite of the borer, have been made available for release following importations from Italy through the Division of Foreign Parasite Introduction. Two releases have been made in New Jersey this fall, in conjunction with second-generation pupation, and the remaining adults will be held over in storage for synchronized releases in other sections at time of spring pupation. Additional releases in New Jersey were made with adults of *Macrocentrus gifuensis* Ashm. and *Inareolata punctoria* (Roman) from material emerging from larval collections in New England, particularly the Taunton district.

Substitutes for bran and sawdust in grasshopper baits.--J. R. Parker, of the Bozeman, Mont., laboratory, says that during the spring and summer of 1938 members of the staff of the Bozeman laboratory conducted experiments in Kay County, Okla., to test bait materials available in Southern States which might be substituted for either bran or sawdust, the most commonly used carriers for grasshopper poison in the North. The following combinations gave results which statistically were not significantly different from a bait consisting of three parts bran and one part sawdust by volume: (1) Citrus meal one part to sawdust three parts; (2) citrus meal one part to cottonseed hulls three parts; (3) mill-run bran one part to cottonseed hulls three parts. The carrier in each bait was equal in volume to 100 pounds of dry bran. Liquid sodium arsenite, 2 quarts, was used as the killing agent.

Effect of migrating swarms of Melanoplus mexicanus on local grasshopper populations.--E. G. Davis, Bozeman, reports that study areas maintained at Mandan, Dickinson, and Beach, N. Dak., were invaded by swarms of *M. mexicanus* Sauss. during the period July 2 to 20. Flights from these areas continued until August 1. During the height of immigrations local populations were increased two to six times, but when emigration terminated they had decreased again to nearly original numbers which exhibited a more uniform distribution than at first. The data on these studies are as follows:

Area	Population per sq. yd. before migration	Population per sq. yd. during migration	Population per sq. yd. after migration
	Number	Number	Number
Mandan------	4.2	10.0	5.6
Dickinson---	4.4	18.0	5.4
Beach-------	2.3	12.0	5.0

Effect of flooding on Camnula pellucida.--E. G. Davis, Bozeman, states that egg beds of C. pellucida Scudd. on the study area maintained in the Centennial Valley, southwestern Montana, were flooded with irrigation water from April 23 until August 15, when water was diverted to permit haying operations. During this period the wild hay meadows, with the exception of a few higher knolls, were almost continuously under water and the soil was at all times supersaturated. Hatching on the dry knolls began on June 15, the normal hatching date for this area. Hatching in ground which had been flooded began on August 20, 5 days after irrigation water was removed, and continued until September 15 in the lower sections of the meadows. Although the eggs were under water for over 3 months during the spring and summer all eggs examined appeared viable and hatched in normal numbers. Although the current year's hatch was not prevented by flooding, it was delayed long enough to prevent grasshoppers from maturing in time to deposit eggs and will result in greatly decreased populations in the hay meadows in 1939.

An effective bait for Mormon crickets.--F. T. Cowan, Bozeman, reports: "After 4 years of intensive work an efficient and economical bait has been developed for adult and late-instar Mormon crickets. It consists of 100 pounds of standard wheat bran, 4 pounds of sodium fluosilicate, and from 12 to 15 gallons of water. This bait was thoroughly tested on small plots in the field over 15 replications and gave an average kill of 86.3 percent. It was also tested under actual farm conditions on plots of from 5 to 18 acres and gave estimated kills of 75 to 95 percent in every instance where temperature and weather conditions were favorable for feeding. The tests on the small plots also showed that the addition of 2 gallons of cane molasses to the basic bran-sodium fluosilicate-water bait gave only slightly higher kills; therefore molasses is not recommended because of the additional cost. Two pounds of sodium fluosilicate per 100 pounds of bran gave significantly poorer kills than 4 pounds, whereas sodium arsenite showed a definite repellent effect, even when used at the rate of 1/2 pint per 100 pounds of bran. Through a series of tests using the old "pan-bait method" extending over some 28 days, it was determined that the greatest numbers of Mormon crickets feed between the hours of 7 and 10 a.m. and at temperatures ranging from 65° to 95° F., with the optimum at 85°."

JAPANESE BEETLE CONTROL

Evergreen-bough inspection.--Inspection of evergreen boughs for gypsy moth infestation started late in October. Five temporary inspectors were employed to supplement the regular force. Most of the boughs cut are spruce. They are packed in 100-pound bales. Shipments were consigned principally to New York City and St. Louis, where they are sold for use as covering on cemetery lots. Before boughs are cut in the gypsy moth lightly infested areas, the areas from which the boughs are to be taken, along with adjoining properties, are scouted for gypsy moth egg clusters. In the absence of infestation, the boughs cut from any particular lot are eligible for certification without piece-by-piece inspection. Two egg clusters each have been found on properties adjoining bough lots at Plainfield, Mass., and Shrewsbury, Vt.

Railway Express Agency fined.--On October 11 the Railway Express Agency through its counsel pleaded guilty to a two-count information alleging violation of the Plant Quarantine Act, arising from shipments of uncertified birch logs consigned from Worcester, Mass., to Atlantic City, N. J., and Washington, D. C. The cartons, with open tops disclosing the logs, were intercepted by a transit inspector in Boston. When the logs were returned to the consignor, an inspector was called in to certify the shipment. Five gypsy moth egg clusters were found on the logs. The shipper was an individual wholly uninformed of the regulations. Although the logs never traveled interstate, a conviction for this violation was possible owing to the fact that the Plant Quarantine Act makes it a misdemeanor for a common carrier to receive for transportation interstate uncertified quarantined products.

Load of firewood yields 75 egg clusters.--Inspection of a carload of firewood loaded at Cornish, Maine, for transportation to Philadelphia, Pa., disclosed 75 egg masses. In addition, 29 egg clusters were destroyed and removed from 7 carloads and 2 truckloads of lumber. Another heavily infested carload of pulpwood disclosed 21 egg masses. Three egg clusters were found on a carload of nursery stock inspected prior to certification. In all, 130 gypsy moth egg clusters were found in the course of the month's inspections.

Mosquitoes chase Christmas tree cutters.--From Addison, Maine, comes the report that mosquitoes are delaying the cutting of Christmas trees, which usually begins late in October. A crew of woodsmen returned to town from the woods, vowing that they would cut no more evergreens until the mosquito nuisance abated. As Addison is within the lightly infested gypsy moth area, all evergreen products shipped from there must be certified before removal from the regulated zone.

Control measures at isolated beetle infestations.--Soil treatment with lead arsenate for Japanese beetle control progressed satisfactorily in several cities in Illinois, Kentucky, Michigan, Pennsylvania, and Virginia during October. In Chicago, 33.1 acres were treated from October 1-19, bringing the total area treated in Chicago this year to 159.8 acres. In Dearborn, Mich., 13.5 acres were treated from October 4-10; and in Detroit, Mich., 16.1 acres were treated during the period October 10-31. In Louisville, Ky., soil treating was started on September 29 and was completed on October 27, with 30.9 acres treated. Treatments in Erie, Pa., were started on October 17. By the end of the month 50.6 acres in Erie had been covered. An additional 12.5

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acres were treated in Oil City, Pa. Soil treatment was not started in Winchester, Va., until October 31, 1.1 acres being sprayed on that date. Soil treating in Detroit, Erie, Oil City, and Winchester will continue into November. All treatments should be completed early in that month. These soil-treating projects are sponsored by the respective States, cities, or other agencies, with the Bureau furnishing the spraying equipment, spray-truck operators, and supervision.

Late adult observations.--In Wilmington, Del., seven beetles, the last Japanese beetles of the season, were collected on a private estate on October 12. In the Elmira, N. Y., district, October 12 was also the last date on which beetles were observed. In Philadelphia the temperature reached 90° F. on October 17, and on that date adults were observed in the open. The last reported beetles in the Philadelphia area were three adults found on outside roses at West Grove, Pa., on October 21.

Combination inspection house and fumigation chamber constructed.--A large class III, or infested nursery, at Princess Anne, Md., has started construction of a concrete building in which stock will be cleaned and washed before inspection for Japanese beetles and other insects. It is anticipated that this building will also serve as an efficient fumigation chamber when needed. This firm has also completed construction of a concrete floor on which its moss will be kept during the shipping season.

Trailer equipment for steam sterilization of soil.--A dealer in mushroom soil, or spent manure, in the Philadelphia district has equipped his 12-ton trailer with a system of piping whereby he may steam sterilize the soil in compliance with the Japanese beetle quarantine regulations. Most of his shipments are transported to Virginia and West Virginia under certification.

Bark beetle invasion as aftermath of hurricane.--In the course of removing English elms blown down by the storm and branches from other English elms in Oyster Bay Township, Long Island, Dutch elm disease sanitation crews discovered a considerable build-up in the elm bark beetle population in the storm-swept area. As English elms suffered the worst damage, observations for beetle activity were made on this species. Four weeks after the storm it was found that *Scolytus multistriatus* Marsh. beetles had completed their main galleries and deposited their eggs, the eggs had hatched, and the larvae had completed the side galleries for a distance of ½ inch or more. In stubs cut from English elms that had dried out very slowly, it was found in some instances that adult beetles had completed their main egg burrows, that eggs had hatched, and the larvae had completed about 1/8 inch of the right-angled galleries. Beetles appeared to have made their greatest progress in wood that was almost dry.

Elm-sanitation activities in Pennsylvania.--Sanitation crews in Bucks County, Pa., are working in Upper Makefield Township, where three diseased trees were found this summer. Blanket permission has been obtained from property owners for removal of all elms within a mile of the confirmed trees. Sanitation work is also progressing in Upper Mount Bethel Township, in Northampton County, where four trees were confirmed this year. Crews from Monroe County have been assigned to this area. For the present the activities will be confined to territory within a radius of a mile from the place where the diseased trees were found. Sanitation work is entirely new to all the W. P. A. workers in Pennsylvania. Two days were spent in training them in the new skills needed to do this work. Demonstrations were given in the field to acquaint the men with the differences between dead and dying elms, beetle wood, and possible beetle wood. Demonstrations were also given of the various rope knots used in sanitation work.

Activities at isolated infections.--Elms in Indianapolis retained their leaves until October 15. All qualified scouts were assigned to dead-tree work so that as much of the area as possible could be covered before the trees became defoliated. During the month specimens were again collected from elms in the Athens, Ohio, district, which earlier in the season had shown apparent symptoms of the disease but in which presence of the fungus had not been confirmed by laboratory culturing.

Check on road movement of elm wood.--For 2 weeks during the month, men were stationed on the principal exit highways at the border of the Dutch elm disease infected zone and protective areas in Connecticut, and on the Connecticut-Massachusetts line to observe the amount of elm wood in transit, particularly in easterly and northerly directions. No elm wood was intercepted. There appeared to be very little movement of logs and rough lumber of any sort to the north and east.

Beetle infestation survey in tree-medication area.--Three hundred chemically treated elms were felled in the Sourland Mountain sections of Somerset, Hunterdon, and Mercer Counties, N. J. These trees will be debarked and examined for the presence of elm bark beetles. Fifty treated trees were also felled and hauled in for examination from Bergen, Morris, Sussex, and Warren Counties, N. J.

Sanitation work under way in isolated infected area.--In the Cumberland, Md.-Wiley's Ford, W. Va. area, elm-sanitation work is well under way. Activities at present are limited principally to the area adjacent to the Potomac River.

FOREST INSECT INVESTIGATIONS

Hurricane alters gypsy moth study plans.--The hurricane damage to the older hardwoods in the area on the Harvard Forest, in which ecological studies on the gypsy moth have been made for the last 2 years, was so great that it is not feasible to continue the studies in that area, according to H. A. Bess, New Haven, Conn. It is estimated that perhaps 75 percent of the trees in the area were blown down and in some parts practically all the trees are on the ground. This is a definite loss to the study but plans are under way to continue similar investigations in an adjacent younger stand not damaged by the hurricane. With the cooperation of the Northeastern Forest Experiment Station, studies on the fluctuations in the population of the gypsy moth are to be made over a period of several years on the Massabesic Forest at Alfred, Maine. This fall approximately 150 acres have been set aside for this study and the egg cluster population, which is quite high, has been measured. This makes a total of four experimental areas of 150 to 1,000 acres each, located at widely separated points in New England, in which it is anticipated to measure quantitatively the fluctuations in the population and the mortality as influenced by ecological factors.

Matsucoccus scale fails to mature on red pine.--T. J. Parr, New Haven, reports that the *Matsucoccus* species associated with pitch pine in New England will also feed on red pine, but it has been definitely proved that they cannot mature and reproduce on that species of pine. Death of the crawlers ensues before more than a very slight swelling of the twig at the point of feeding takes place.

Parker returns from Dutch elm disease studies in England.--D. E. Parker has returned to the Morristown, N. J., laboratory, after being stationed at Oxford, England, for 3 years. During the time he spent abroad Mr. Parker made studies and observations on insect vectors of the Dutch elm disease fungus. While his experiments were conducted in England he made trips to certain continental European countries in which the disease occurs. Studies made in England showed the larger European elm bark beetle (*Scolytus scolytus* F.) to be the most important carrier of the fungus. Besides being more important as a carrier than the smaller European elm bark beetle (*S. multistriatus* Marsh.), *S. scolytus* was more prevalent and more widely distributed. *S. scolytus* is not known to be present in the United States but *S. multistriatus* occurs in the northeastern section of our country. Another European scolytid beetle, *Pteleobius vittatus* F., not present in the United States, transmitted the fungus to nursery trees, when the adults were artificially contaminated, and the trees developed normal disease symptoms. No transmission of the fungus was obtained however with adults reared from wood from diseased elms and, although many examples of *P. vittatus* work were examined in the field, it was never possible to credit the species as being the cause of infection in diseased trees. A number of other arthropods were found to carry the fungus but Mr. Parker states that none of them is to be considered important in connection with the progress of the disease.

Types of elm trap trees attractive to elm bark beetles.--R. R. Whitten and W. C. Baker, Morristown, have reported on tests with elm wood traps for the two elm bark beetles, *S. multistriatus* and *Hylurgopinus rufipes* Eich. During the tests made in 1935, felled elm trees were found to be more attractive to the beetles than girdled trees, severed but hanging limbs, or logs. In 1937 it was observed that certain chemically treated trees were more attractive than felled trees. Further studies conducted in 1938 in two large field plots showed that standing elm trees injected with sodium chlorate were significantly more attractive than were felled trees.

Hibernation of Conophthorus.--Donald DeLeon, of the Fort Collins, Colo., laboratory, reports that last spring while looking under bark scales on the trunk of ponderosa pine for spruce budworm hibernacula, a few fragments of adults of a cone beetle, *Conophthorus* sp., were found. In the Denver Mountain Parks area on September 23, C. L. Massey and Mr. DeLeon found five or six live specimens under the bark close to the phloem. The galleries were short and extended in no particular direction. They were confined chiefly to the region 3 inches or so above the ground. It appears quite likely that the beetles may hibernate in this location. No definite determination has yet been obtained but it is likely that the species is *Conophthorus scopulorum* Hopk.

Mountain pine beetle in Mt. Rainier National Park.--The 1938 survey of activity by Dendroctonus monticolae Hopk. in Mt. Rainier National Park revealed only five active spot infestations, totaling approximately 1,040 trees on 38 acres, according to J. M. Whiteside, Portland, Oreg. As all but two of these infestations are in unfrequented areas, and in keeping with the insect control policies of the park, only 150 of this total number of trees will be treated by C. C. C. labor during the spring months. The largest concentration was found near the headwaters of Laughingwater Creek, in an infestation of several years' standing and where approximately 870 trees were marked or estimated on 33 acres of mixed white pine stand.

Oregon-Washington western pine beetle survey completed.--Another chapter in the intensive western pine beetle check-plot surveys, conducted cooperatively in Oregon and Washington by the Forest Service, Office of Indian Affairs, and the Portland forest-insect laboratory, was completed early in October. A total of 88,570 acres, representing 214 plots, was surveyed during 1938 by crews of these agencies. Although this represented a slight reduction as compared with last season's totals, better coverage of the pine types was obtained by a reallocation of certain plots and the establishment of new plots in previously unsampled areas. Bark beetle activity in Region 6 has been thoroughly investigated as a result of these cruises, together with observational surveys which covered approximately 100 percent of the commercial pine stands.

GYPSY MOTH AND BROWN-TAIL MOTH CONTROL

Leaf sections driven against trees resemble gypsy moth egg clusters.--Small pieces of leaves torn from trees by the recent hurricane were driven against other trees with such force that they were still adhering to the tree trunks and large limbs in October. As some of these leaf sections closely resemble gypsy moth egg clusters in size and color, it is often impossible to differentiate between them from the ground when the leaf sections are lodged on the upper parts of tall trees. This condition has slowed up scouting work in some sections because of the necessity of doing much extra climbing in order that no real gypsy moth egg clusters may be missed.

Gypsy moth crews guard against starting forest fires.--Unseasonably warm weather and lack of rain since September 21, together with the tangled mass of trees and branches felled by the hurricane, has created a serious fire hazard in the forest lands in which gypsy moth work is being conducted. A strict ban on smoking and the building of fires by employees of this project is in effect and will continue to be enforced until there is no further danger of forest fires.

Small gypsy moth infestation found in the barrier zone section of Vermont.--On October 3 a single-egg-cluster gypsy moth infestation was discovered in Granville, located just within the border of the barrier zone in central Vermont. This is the second single-egg-cluster infestation to be found in Granville during the present fiscal year. The growth within a radius of 50 feet of the infested tree consists of beech and spruce, with a single yellow birch nearby.

Artillery range scouted between training periods.--A field artillery firing range, used by the United States Army for training Regular and National Guard units while stationed at Fort Ethan Allen, is located in the towns of Underhill and Bolton, Vt. The range is heavily wooded and is included in the territory to be scouted for the gypsy moth during the current fiscal year. No scouting could be done in that section from July 1 to September 25, as the range was used almost continuously and no entry to the reservation was permitted. However, the range was idle from September 25 to October 12, and gypsy moth crews assigned to duty in the two towns were able to scout in that region. During the performance of the scouting work many unexploded 3-inch and 6-inch shells were observed. Military guards stationed at the range and the supervisor directing gypsy moth work in that locality cautioned all of the men working in the range that the unexploded shells must not be disturbed, as there was danger of explosion if they were touched or moved. The shells will be exploded by trained Army personnel using devices especially designed for that purpose after the firing is completed in late fall or early winter. No gypsy moth infestations were found on the range.

Many trees blown down by hurricane at gypsy moth infestation.--A gypsy moth supervisory employee recently visited a gypsy moth infestation located last year in Mount Holly, Vt. He estimated that more than 50 percent of the trees in an area of approximately 15 acres surrounding the infested site were blown down during the September hurricane. Mount Holly is located east of the barrier zone, in the south-central part of Vermont.

Isolated infestation discovered in Massachusetts.--A new gypsy moth infestation was recently discovered in the western part of North Adams Township in northwestern Massachusetts, near the Williamstown line. Information so far available indicates that this infestation is relatively small and should be easily exterminated. This infestation is notable because it is located several miles from any other infestation found in this section during the last several years, whereas most of the infestations located in the barrier zone district of Massachusetts this season are in the immediate vicinity of old infested sites.

Sprayed foliage carried considerable distances by storm.--A large amount of foliage from woodland trees showing evidence of lead arsenate spray was recently observed on the ground in Great Barrington, Berkshire County, Mass., far from any area that was sprayed for the gypsy moth by this Bureau last summer. This seems to indicate that the leaves were torn from the trees in sprayed areas and were blown considerable distances by the hurricane. The danger of animals being poisoned by this foliage does not appear to be great, as leaves dry quickly after becoming detached from the twigs.

Scouting completed in lowlands along the Lackawanna and Susquehanna Rivers.--Gypsy moth scouting in the lowlands bordering the Lackawanna and Susquehanna Rivers in Pennsylvania, which was temporarily suspended during the September flood, was resumed on October 3. As most of the scouting in this section had been completed before the waters rose, only slightly more than 2 weeks were required to finish the work, and the territory was entirely scouted by about the middle of October. One infestation, consisting of 16 egg clusters, was discovered in Jenkins Township on an accumulation of debris that had apparently originated at the site of some nearby infestation, been dumped along the river bank, and moved to the point of discovery by the flood waters.

Report of infestation in Stroudsburg, Pa., unfounded.--A report recently received at the Gypsy Moth Office at Wilkes-Barre, Pa., relative to the existence of a gypsy moth infestation in Stroudsburg, which is located east of the Pennsylvania quarantined area, was investigated by thoroughly experienced gypsy moth field men. Although these men carefully inspected the supposedly infested area, they were unable to discover any indications that gypsy moths were present and apparently the report was unfounded.

Spraying equipment needed in Connecticut.--A meeting of all gypsy moth foremen and superintendents connected with the work in progress at the severe infestation in the Granby-Simsbury area was held in Connecticut on October 13. The meeting was also attended by one of the district foresters, the Federal C. C. C. inspector of the State, two men from the State gypsy moth organization, and representatives of the Federal Gypsy Moth Office in Greenfield, Mass. The field work was inspected and the problem presented by this heavy infestation was discussed. It was the consensus of opinion that spraying was greatly needed in order to obtain the desired control of this infestation, and the possibility of obtaining equipment for this purpose was considered. It was pointed out that all of the Federal Bureau's available equipment is needed in and near the barrier zone area and in Pennsylvania, and that an attempt should be made to obtain spraying equipment elsewhere. Suggested sources were the C. C. C., the State Foresters Organization, property owners, and the two towns involved.

Some heavy infestations not seriously damaged by hurricane.--A survey of several woodland areas in Connecticut and Massachusetts which contain heavy gypsy moth infestations and in which considerable gypsy moth work has been done, revealed that in particular cases, such as at West Peak in Meriden, Conn., at the Granby-Simsbury infestation in that State, and at the severe infestation in Russell, Mass., there was no large number of trees felled by the storm. Although in all of these areas some trees were blown down, conditions at these points are not so serious as in many other locations.

C. C. C. gypsy moth camp receives high rating.--The Westfield, Mass., C. C. C. gypsy moth camp has been designated as outstanding and has received the next-to-highest rating for the First Corps Area for the eleventh enrollment period.

New C. C. C. enrollees trained at infested sites.--During the first week in October many new C. C. C. enrollees who started work at the beginning of the new enrollment period received training in gypsy moth scouting, creosoting, climbing with ropes and spurs, and in the use of sharp-edged tools. These men were concentrated, as far as possible, in severely infested locations where their work during the training period would be most useful in completing needed ground work before snow falls.

PLANT DISEASE CONTROL

Barberry bushes rusted heavily in certain counties in Montana.--A local rust spread directly traceable to heavily infected barberry bushes was located by survey crews in Yellowstone County in July of this year, according to reports received from Ivar Tvilde, assistant leader in charge of field operations in Montana. Eradication work during the last summer has been restricted to areas of native timber in Yellowstone County. Since work opened in the spring, more than 300 bushes have been found and 10 new properties recorded. An average of 27 relief laborers have been employed since work was begun in the spring. Owing to severe winter temperatures it is planned to discontinue field operations about December 15.

Abandoned farmsites in Missouri yield many barberry bushes.--In a recent report relating to the progress of barberry-eradication work in Missouri, George M. Frandsen, leader in charge, summarizes information relating to the number of abandoned farmsites encountered by survey crews during October. As a result of a survey of 98.5 square miles in Adair, Audrain, Knox, Macon, and Randolph Counties, 86 abandoned farmsites were encountered in 1 month. In Adair County 12 abandoned farmsites were found in 11 square miles; 2 in 22 square miles in Audrain County; 6 in 20.5 square miles in Knox County; 46 in 24 square miles in Macon County; and 20 in 21 square miles in Randolph County. This information is important in view of the consideration that has been given to limiting survey in certain rural sections in Missouri to an inspection of farmsites and timber immediately surrounding the buildings. Mr. Frandsen points out that, had a procedure of this kind been followed in October of this year, most of the 86 abandoned farmsites would have been missed because there was no road or other indication that these old farmsites existed. Since barberry-eradication work was begun in Missouri in September 1933, 1,1[illegible]4 properties having 17,664 bushes have been found, 2[illegible]6 of which were rural properties, and 38 of this number could be classed as abandoned farmsites and would have been missed had only a property-to-property survey been made. Although the number of rural properties in Missouri having barberry bushes is rather limited in comparison to some of the States farther north, infested properties have been found at the rate of about 25 per county and the 38 that would have been missed, had only a property-to-property survey been made, would represent about 15 percent of the rural infested properties in the area which has been worked to date.

Blister rust camps closed for season.--The closing of the blister rust control camps in the western white pine region was started the latter part of September. One 40-man haul camp out of Priest River was continued during October. In addition some preeradication work was carried on in the Coeur d'Alene, Kaniksu, and St. Joe National Forests. In the sugar pine region, work ceased in all camps in California by October 15, except the Soda Springs C. C. C. camp on the Lassen National Forest, the Yosemite Park C. C. C. camps in which eradication continued until the latter part of October, and the Miami Creek camp on the Sierra National Forest which will continue *Ribes* eradication as long as the weather permits and will then move to Mariposa, Calif. In Oregon *Ribes* eradication terminated on October 10.

Blister rust found in many new counties.--Weather conditions late in the summer and early in the fall apparently favored the spread of blister rust. The disease has been found for the first time on *Ribes* in 44 new counties and on white pine in 1 county in 8 States. In 29 of these counties the rust was found on the cultivated black currant (Ribes nigrum), indicating the importance of this species in the spread of the disease.

Blister rust exhibits.--During September blister rust exhibits were placed at two State fairs, seven county fairs, and a 4-H Club Exposition in the Lower Peninsula of Michigan. R. I. Thompson, in charge of blister rust control in this part of the State, writes that there was a total attendance at these fairs of over 1,450,000. Interviews were extended to several thousand interested people and information given on the blister rust disease and methods of control.

COTTON INSECT INVESTIGATIONS

Cotton aphid studies.--Search for cotton plants immune or tolerant to leaf aphids and studies of some of the factors influencing the aphid infestation were made by E. W. Dunnam and J. C. Clark, of the Stoneville, Miss., laboratory during the past season. The Bureau of Plant Industry maintains a large collection of cotton in their genetics plots at Stoneville, including all of the species and hundreds of varieties, strains, and crosses of cottons. All of these plants were examined and while there were many gradations in intensity of infestation no plants were found to be immune to aphid attack. The wild cottons and nonproductive kinds generally had the lightest aphid populations and when a lightly infested plant was found among the crosses it was invariably a stalk without fruit and a segregate similar to the wild types. Twelve pure-line varieties were grown in pots indoors and in single rows side by side in the field for comparing the aphid populations. In the laboratory when a given number of aphids were placed on each plant the increase was more rapid and the populations remained higher on the slow-fruiting varieties with less determinate growth habits. These varieties were excessively dusted with calcium arsenate to build up a heavy aphid infestation in the field. All of them became seriously infested although some were more tolerant than others. Individual plants with infestations ranging from extremely heavy to light and with vigorous leaves that were more resistant to shedding when heavily infested were found in all of the varieties but none were immune. Several flowers on each plant were self-fertilized and the bolls ginned separately in order that pure-line seed will be available. The history of each plant will be reviewed by a competent cotton breeder and seed from the most promising selected for further tests for resistance. The relation of pilosity and the application of calcium arsenate to aphids were studied in three varieties. A very smooth variety and a variety with intermediate pilosity, selected from progeny of the same parents and a very hairy variety not related generically to the above were used. Plants of each type were dusted three, six, and nine times and left undusted. As in previous results, the more pilose plants held more calcium arsenate and retained it for a longer time than did the smooth plants. The adherence of calcium arsenate on each type was also much greater when dusted while wet with dew than when dusted while dry. For all practical purposes three applications of dust appeared to cause as much increase in aphids as six or nine applications. The total aphids as determined by examining 900 2½-inch leaf disks from each class throughout the season were 19,000 on the undusted plants, 27,000 on the 3-application, 31,000 on the 6-application, and 29,000 on the 9-application plants. The maturity of the leaves following the first crop of bolls appeared to be a factor in reducing the infestation on the plants receiving nine applications of dust, as the leaves were maturing and becoming unfavorable for the aphids by the time the latter applications were made. The total aphids on the disks from the dusted plants of the smooth variety were 23,000; from the intermediate pilosity, 29,000; and from the very hairy, 36,000. Less differences were found in the populations of the undusted plants of the three varieties. Parasites of the aphids did not appear until there were approximately five aphids per 2½-inch leaf disk and parasitization was higher in all cases on the dusted than on the undusted plants. Thus the increase in aphids following dusting with calcium arsenate did not appear to be due to killing of the parasites by the arsenical, but the density of the aphid population governed the extent of parasitization. The pH of the soil from the plots was determined immediately after the dustings were completed by F. H. Tucker. The acidity of the soil in the checks was 6.32. When three, six, and nine applications of calcium arsenate at the rate of 12 pounds per acre were applied the pH values increased to 6.38, 6.53, and 6.85 respectively. The change in the soil from acidity toward neutrality (7.0), or some other unknown factor, apparently caused the crop to mature earlier as the amount of calcium arsenate applied was increased. Whether the soil medium affects the pH of the cell sap in the leaves, which might favor aphid production, remains to be determined.

How do arsenicals kill the cotton flea hopper?--Experiments were conducted from June to August by G. D. Green, at the Port Lavaca, Tex., laboratory in an effort to determine how arsenicals kill the cotton flea hopper (*Psallus seriatus* Reut.). Paris green and calcium arsenate were used in the tests as these are the arsenicals generally mixed with sulphur to increase its effectiveness against the flea hoppers. Insects were all field collected from croton plants and most of the tests were made on growing cotton plants, although croton was used in some. Flea hoppers are difficult to maintain in cages and the mortality in the checks was generally high. Several types of cages were used, including cages over living plants, small cages fastened to the leaves, and bags over portions of the plant. In the outdoor cages it was necessary to protect the insects from the excessive heat of the midday sun by suspending a black cloth shade supported by wires above the cages. Considerable variation in the numbers of insects used per test was necessary because of the difference in types of cages. A number of replications of each experiment were made and checks maintained under similar conditions except for treatments. In all cases the insecticides were applied at heavier rates than ordinarily used under field conditions, and where dusts were used the plants and insects were dampened with water applied with an atomizer to simulate early morning dusting conditions. As the cotton flea hopper is a sucking insect, the experiments were planned to test the possibility of (a) killing by contact and (b) arsenic being absorbed by the plant and taken by the insects through the food. In the contact series, adults dusted with paris green and placed on untreated plants showed 61.9-percent mortality as compared to 10.6 percent in checks; plants dusted with 10-percent paris green to 90-percent sulphur, 68.1-percent mortality, check 40.4 percent; and plants dusted with calcium arsenate 30.3-percent mortality, check 10.6 percent. The mortality of untreated adults confined on plants dusted with paris green was 95.5 percent and of plants dusted with calcium arsenate 77.8 percent, as compared to 10.6 percent in the checks; on plants sprayed with paris green the mortality was

77.5 percent and 29.2 percent in the checks. When the insects were sprayed with paris green and caged on untreated plants the mortality was 47.2 percent, as compared to 29.2 percent in the checks. In the absorption series, adults confined on plants dusted with paris green and calcium arsenate and the plants thoroughly washed with water after 24, 48, or 72 hours the mortality was 38.3 percent for the paris green, 27.3 percent for the calcium arsenate, and 19.5 percent for the check series. The mortality of the flea hoppers confined in small covered cages attached to the upper surface of leaves, which had been dusted on the under side with paris green, was 56.5 percent but the mortality in the checks with this type of cage was also 55.4 percent. Where the buds of the plants were protected by paper bags and the remainder of the foliage dusted with paris green, the mortality in the insects caged on the undusted buds was 32.7 percent, and 29.1 percent in the checks. In tests where the insects were fed on plant cuttings placed in water containing paris green and calcium arsenate the results were inconsistent because of arsenical injury to the plants. Sufficient work has not been done to draw conclusions, but under field conditions where both plants and insects are dusted at the same time, it appears that the toxicity of arsenic to the cotton flea hopper is due to the combined effect of a part of the arsenic being taken with the food after absorption by the plant, and the remainder by external contact of the dust settling on the insects during dusting and by contact of the insects with the dust on the plants. If part of the lethal dose of arsenic is received from each of these sources, results of experiments using dead and live insects as a criterion to test each source separately cannot be used, as individual insects receiving less than a lethal dose will not die.

PINK BOLLWORM AND THURBERIA WEEVIL CONTROL

Cotton stalk destruction.--During October practically all of the time of the personnel in the lower Rio Grande Valley was given to carrying out the stalk-destruction program. At the beginning of the month there remained 23,161 acres of unplowed 1938 cotton stalks and 495 acres of soca cotton. In addition there were several thousand acres of poorly plowed land on which a good many fruiting stalks were left. A determined effort was made during October to destroy these remaining stalks and it is believed that they were reduced approximately 50 percent, eliminating the heaviest growth which was most dangerous. Stalks remaining at the end of October may be listed under three distinct classifications: Scattered stalks or root sprouts, ranging from less than one to several hundred stalks per acre on 75 percent of the cotton land; cotton land of nonresident or unknown ownership abandoned by the grower; and soca cotton on abandoned land. At the close of the month plowing of stalks had been completed on all acreage in the northwestern part of the district in Hidalgo and Starr Counties known as the dry-land farming section, where an extension of time had been granted. A total of 22 formal charges were filed in the county courts against persons who were willfully neglecting to destroy stalks on land owned or controlled by them, but in every case where charges were filed the persons involved have gone ahead and destroyed the stalks. At the end of October there remained only 239 acres of 1938 cotton stalks still standing, with an additional 1,556 acres of stub or volunteer cotton which had not been plowed. This cotton, however, did not bear fruit in October. Three of our inspectors have continued to assist the Mexican inspectors in contact work on the Mexican side of the river. During October a very material reduction was made in the acreage of cotton stalks remaining there. There are only a few acres of standing stalks remaining in the Matamoros area. This is on land more or less isolated by the floodwater of the Rio Grande; however, there is a considerable amount of stub cotton in that area which has not been plowed. Toward the close of the month the Mexican officials began a concentrated drive to have this work completed and a large reduction in stub acreage is expected very shortly. Taking the area in Mexico as a whole, it is relatively stalk-free. In the area from Brownsville 90 miles west to Camargo and extending about 20 miles south, there are only a few fields in which stalks have not been cut or plowed; however, in areas to the south where fields are widely scattered and contact work has been difficult progress has not been so good. In summing up the situation on both the American and Mexican sides, it may be said that a very large percentage of the cotton farmers have made a sincere effort to destroy the cotton stalks in accordance with the program. However, in such a warm climate it is a very difficult job to kill cotton plants and in a number of fields in the vicinity of Brownsville-Matamoros pink bollworms were being found on bolls from second-growth cotton at the end of the month. On the whole the stalk-destruction program made favorable progress in the Coastal Bend section during the month. An extension to November 1 was given farmers in this section in which to destroy stalks. Only a few charges were filed in State courts against those who failed to comply.

Big Bend clean-up.--Clean-up work in the Big Bend area was rapidly approaching completion at the end of the month and it is believed that much good is being accomplished, as the stalks are being destroyed before frost. This makes possible a more thorough clean-up, because there is not so much shattering of material carrying the pink bollworm during the process of cutting stalks. A much better job of clean-up is being done on the Mexican side than has been the case in previous efforts of this kind.

Gin-trash inspection.--Gin-trash inspection for the month was concentrated mainly in the Panhandle section of Texas and in the cotton-growing areas of Arizona. No new infestations were found in the Panhandle of Texas but specimens were taken from several of the counties already under regulation. In Arizona a new infestation was found in the Salt River Valley of Arizona, where the pink bollworm was eradicated a number of years ago. A reoccurrence was also found in the Casa Grande-Coolidge area, as well as at Tucson and Safford, all of which were infested last season. In Ward, Reeves, and Pecos Counties, Tex., and in Eddy and Chaves Counties, N. Mex., all in the Pecos Valley, enough inspection was done to determine the status of the infestation. It appears that in the lower end of the Pecos Valley the worm population is building up somewhat, an average of about 20 worms per bushel of trash being taken from that area. Considerable incidental inspection was done in the El Paso Valley district during the month by the regulatory inspectors, and from about 224 bushels of trash more than 10,000 pink bollworms were taken. The major portion of these worms came from the heavily infested part of Hudspeth County; also, from El Paso County and from Dona Ana and Luna Counties, in southern New Mexico. The gin-trash inspection being carried on in Alabama and Georgia was discontinued during the first week in October, all inspections for the season having been negative. Inspection of sea island cotton fields was also discontinued during the first week of the month. In addition to the inspection, a considerable number of green bolls were collected from Florida and Georgia for preservation and later inspection.

Wild-cotton eradication.--A W. P. A. allotment was made available for wild-cotton eradication work during the first week in October, and the first crew of W. P. A. laborers was placed in operation at Key West on October 13, with other crews being set up during the month at Key Largo and in the Fort Myers and Bradenton subdistricts. The W. P. A. personnel was increased from 7 on October 13 to approximately 75 on October 31. During October a total of 17,870 wild cotton plants was destroyed, of which only 19 had mature bolls. Of these 18 were from Key Largo, and from the mature bolls of these plants 5 specimens of the pink bollworm were found. One pink bollworm was taken from a mature boll from Matecumbe.

Thurberia-plant eradication.--Work on the destruction of Thurberia plants in the Santa Catalina Mountains during October slowed down to some extent so far as actual work on the cotton line was concerned because of so many men having to be used in dismantling the camp at Italian Ranch and preparing and finally erecting a new camp in Finger Rock Canyon. After intensive search the best site that could be found in this canyon necessitated a tremendous amount of leveling and rock breaking and a considerable amount of rather heavy trail building. No water fit for human consumption could be found throughout the canyon and 300 gallons of water is having to be hauled each day. Neither is there any wood in the canyon and coal will have to be hauled for all purposes. This will be considerably cheaper than hauling wood several miles over mountains with no trails and by pack animals. During October 832 man-days were spent in locating and destroying 11,013 plants over a rough area of 2,640 acres. Eighty-seven 1/2-gallon cans of green Thurberia bolls were gathered from various mountain ranges and will be sent to the San Antonio laboratory for inspection in the near future.

TRUCK CROP AND GARDEN INSECT INVESTIGATIONS

Flight ability of sweetpotato weevil adults.--K. L. Cockerham, of the Sunset, La., laboratory, reports that experiments this year have demonstrated that infestations of Cylas formicarius (F.) were found in trap patches of sweetpotatoes planted 1,320 and 1,760 yards, respectively, from the focal point of dispersal. At the former location approximately 8 percent of the sweetpotato plants were found infested, whereas at the latter location approximately 4 percent of the plants were infested when examined in September. These findings indicate that the sweetpotato weevil adult is capable of flight for a distance of at least 1 mile. In addition, a number of sweetpotato weevil adults which had been colored with dyes and liberated at a focal point of dispersion were caught at trap lights located from 1/4 to 1/2 mile, respectively, from the point of liberation.

Pyrethrum-oil sprays control beet leafhopper in Arizona.--Van E. Romney, of the Phoenix, Ariz., laboratory, reports that applications during the period October 28-November 5, 1937, of a pyrethrum-oil spray directed against Eutettix tenellus (Bak.) on seed beets have apparently resulted in an average increase of approximately 360 pounds of clean sugar beet seed per acre over the production of beet seed in comparable untreated plots. The value of the seed obtained by this increase amounts to about $30 per acre. The plots sprayed twice did not exhibit a significant increase over the plots sprayed once early in the season.

Control of mole crickets in Florida.--J. N. Tenhet, of the Sanford, Fla., laboratory, reports that cultural control experiments during the summer of 1938 against mole crickets (Scapteriscus spp.) demonstrated that a satisfactory degree of control of these pests on celery seedbeds could be obtained by deep plowing at 2-week intervals during May and June. However, the experiments disclosed that, unless barriers or walls were erected around the treated seedbeds, the mole crickets were very likely to move into the treated areas very quickly after the beds were prepared for planting. A series of experiments on seedbeds with various poisoned baits yielded good control of the mole crickets; however, under field conditions, a poisoned bait consisting of corn meal and zinc phosphide did not show any marked superiority to poisoned baits containing wheat bran, cottonseed meal, and paris green or calcium arsenate. Tests with poisoned baits containing zinc phosphide, calcium arsenate, or paris green demonstrated that the first two baits were safe to use on celery seedlings, Bermuda grass, and carpet grass, but the bait containing paris green burned celery seedlings very severely and caused moderate injury to carpet grass. The paris green bait, however, did not cause appreciable injury to Bermuda grass.

Life cycle of wireworms in Pacific Northwest.--E. W. Jones, of the Walla Walla, Wash., laboratory, reports that a summary of the data obtained in seasonal history studies of the Pacific coast wireworm (Limonius canus Lec.) and the sugar beet wireworm (L. californicus Mann.), conducted in the Pacific Northwest during the 4-year period 1935-38, revealed that neither of these species ordinarily completes its life cycle in 1 year. These studies disclosed that a larger number of L. canus complete their life cycle within a 2-year period than of L. californicus. Most of the L. canus individuals under observation completed their life cycle in 3 years, and less than 10 percent of the individuals required 4 years for this purpose. Judging from available data, it appears that L. californicus has a life cycle ranging from 2 to 5 years in duration. Approximately 70 percent of the 1935 brood of this species had completed their life cycle at the expiration of 4 years.

Seasonal injury by cabbage caterpillars in South Carolina.--In summarizing experiments conducted against the common species of caterpillars (Pieris rapae (L.), Autographa brassicae (Riley), and Plutella maculipennis (Curt.)), affecting cabbage during the springs of 1936, 1937, and 1938, W. J. Reid, Jr., of the Charleston, S. C., laboratory, reports that on an average during the 3-year period approximately 28 percent of the cabbage plants under observation were rendered ineligible to U. S. Grade No. 1 because of caterpillar damage, an additional 14 percent were rendered unmarketable on account of defects other than those caused by insects, leaving a remainder of only approximately 58 percent which were suitable for marketing as U. S. Grade No. 1. Keeping in mind conditions that existed throughout the 3-year period during which the spring crop of cabbage was grown in the Charleston locality, only about 8 percent of the total number of plants damaged by caterpillars were harvested prior to May 1, even though approximately only 25 percent of all the plants in the fields under observation had been harvested by that date. Approximately 50 percent of the plants harvested after the third week of May were classified as having been rendered unmarketable because of caterpillar damage. It seems evident, judging from the data now available, that under average climatic conditions the greatest degree of damage caused by caterpillars to the spring cabbage crop in the Charleston locality of South Carolina occurs in May and June.

Derris, cube, and cryolite control Mexican bean beetle on pole beans.--L. W. Brannon, of the Norfolk, Va., laboratory, reports that results of an experiment conducted in pole lima beans demonstrated that dusts or sprays containing derris, cube, or cryolite are effective against *Epilachna varivestis* Muls. on crops of lima beans grown commonly on poles and from which pickings are made throughout a long period of the growing season. Insecticide applications made to the pole beans on June 14, July 1, and July 14, were apparently reflected throughout the season in increased yields, as compared to comparable untreated plots, as at the end of the seventh picking (approximately September 30), pronounced increases in yield were noted on the treated plots. The effect of the insecticide treatments on the first and second pickings of the crop earlier in the season were also strikingly apparent, as judged from the yield records made at that time. It appears that sprays or dust mixtures containing derris, cube, or cryolite, when applied properly, are effective in controlling the Mexican bean beetle, not only on beans of the bush type but also of the pole type.

INSECTS AFFECTING MAN AND ANIMALS

Toxicity tests against mosquito larvae.--Preliminary tests with 1-phenyl benzothiazole by W. V. King at Orlando, Fla., against *Culex* larvae and by H. H. Stage at Portland, Oreg., against *Aedes* larvae show that this material is quite toxic to these two species but is less toxic than phenothiazine. A sample of cuprous arsenite produced in the Tennessee Valley Authority laboratory at Wilson Dam was tested for its toxicity against mosquito larvae by W. V. King, and was found to produce a higher mortality than did a commercial brand of paris green. Both these materials, however, were more toxic than calcium arsenite.

Efficiency of poisoned baits for destroying rodent hosts of American dog tick.--C. N. Smith, of the Martha's Vineyard, Mass., laboratory, reports that the use of a poisoned bait consisting of chopped apples and zinc phosphide apparently reduced in 1 week's time the meadow mouse population to a level which required 3 months to attain by the use of a poisoned-grain bait.

Texas ranchmen interested in cattle grub control.--During the winter of 1937-38, 265 Hereford cattle on a 32,000 acre ranch in King County, Tex., were treated with a cube-powder wash to determine the feasibility of using this treatment for the control of the cattle grub on range animals. The insecticide consisted of 1 pound of cube powder (90 percent 250-mesh to 4 percent rotenone) in suspension in 1 gallon of water containing approximately 4 ounces of home-made lye soap. The wash was thoroughly applied to the backs of the animals by rubbing it into the hair with a stiff fiber brush. About 8 ounces of the wash was used for each animal and it was possible for 4 men to handle and treat 100 animals per hour. The treated animals were segregated in a 10-section pasture surrounded by other pastures comprising some 227,000 acres and on which were run a proportionate number of untreated cattle. A check on the degree of infestation in treated and untreated animals during the fall of 1938, after being exposed during one heel fly season after the application of the treatment, showed an average of only 1.06 grubs per head in the treated animals; whereas, an average of

7.06 grubs per head were found in untreated animals running in adjoining pastures. Among untreated calves born after the adults were treated but before or during the heel fly season and allowed to run on the same pasture as the treated animals, there was an average of 4.11 grubs per head. Calves born at approximately the same time but run on the pasture with the untreated adults were infested with an average of 12.4 grubs per head. The apparent great reduction of cattle grub infestation as shown by this test has encouraged the owner of the ranch to treat all his cattle during the coming winter. The owners of neighboring ranches were much interested in the results obtained and indicated that they would begin treatments of their cattle this season. R. R. Reppert, Texas State extension entomologist, and H. G. Hackney, county agent, King County, initiated the tests and E. W. Laake, of the Bureau's Dallas, Tex., laboratory, cooperated in the checking of results.

FOREIGN PLANT QUARANTINES

A quarter century of interceptions.--The first list of interceptions, covering the period July 1 to December 31, 1913, and prepared by E. R. Sasscer, was issued as News Letter No. 1, dated February 2, 1914. Thereafter such lists were issued monthly for a time in the News Letter series, the final installment for the fiscal year 1914 being News Letter No. 11 dated July 9, 1914. The interceptions for that year total 1,456, of which 256 were diseases. The countries of origin of these interceptions totaled 59, the bulk of the interceptions being from much the same list of countries as now. Gypsy moth, brown-tail moth, pink bollworm, European tussock moth, citrus leaf miner, and crown gall are among the intercepted pests given special mention. Interceptions of powdery scab of potatoes by Harry B. Shaw and of papaya fruitfly by H. L. Sanford are given special mention also. It is interesting to note that Messrs. Sasscer, Shaw, and Sanford are still associated in the foreign plant quarantine work. Incidentally, it was found that the first disease listed as determined to species was *Ramularia angustata* which does not appear in our interception index files. A brief check-up indicated that the insects have been indexed. A casual examination of the interception lists indicated that the hosts occurring most often were palms, on which 145 interceptions were made; bay trees, 141; rhododendron (including azaleas), 132; box, 92; and orchids, 55. While over one-third of the interceptions were made on this small group of hosts, a wide variety of hosts occurs in the list for the year. The twenty-fifth year report (for the fiscal year 1938) is in course of preparation. While the interception figures are much larger and the material, both hosts and pests, somewhat more varied, it would appear that the old records are very creditable when the newness of the work and the number of inspectors employed are considered.

Pear tingid from Italy.--Two living specimens of the pear tingid (*Stephanitis pyri* F.) were intercepted at New York on November 11, 1937, on a persimmon fruit in baggage from Italy. This is a serious pest of pear and apple in Europe. Badly infested leaves become yellow, then brown, and die. The injury, which is usually severe, consists in the loss of sap, the destruction of the parenchyma, and the prevention of the functions of the leaf owing to the covering of excreta.

Entomological interceptions of interest.--Five living larvae of the fruitfly *Anastrepha fraterculus* (Wied.) were intercepted at Laredo, Tex., on July 16 in three peaches in baggage from Mexico. A living larva of the trypetid *Rhagoletis cerasi* L. was intercepted at Boston on July 16 in a cherry in ship's stores from Italy. This species is known in European literature as the cherry fruitfly. Ten living adults of the bruchid *Specularius erythrinae* Brid. were taken at New York on July 19 in *Erythrina* seed in the mail from the Union of South Africa. A living larva of the avocado seed moth (*Stenoma catenifer* Wlsm.) was intercepted at San Pedro, Calif., on August 2 in an avocado seed in baggage from Ecuador. A living adult of the weevil *Mesites pallidipennis* Boh. arrived at Norfolk, Va., on June 24 under the bark of a walnut log in cargo from France. Living specimens of the coccid *Lichtensia lutea* (Ckll.) were found at Hidalgo, Tex., on May 27 on croton leaves in baggage from Mexico. A living adult of the weevil *Cholus nigromaculatus* Champ. was intercepted at San Francisco on June 20 on an orchid (*Laelia* sp.) in express from Mexico. Eleven living larvae of the bean pod borer (*Maruca testulalis* Geyer) were taken at Mobile, Ala., on July 26 in green string beans in ship's stores from Puerto Rico. A living adult of the elaterid *Ischiodontus anceps* Cand. was found at Baltimore, Md., on June 30 on bananas in cargo from Guatemala. A living larva of the pink bollworm (*Pectinophora gossypiella* Saund.) was intercepted at Washington, D. C., on August 19 in a cottonseed in the mail from Japan. A living larva of the Mexican bean beetle (*Epilachna varivestis* Muls.) was intercepted at El Paso, Tex., on July 21 on a Swiss chard leaf in cargo from Mexico. This insect was formerly known as *Epilachna corrupta* Muls.

Pathological interceptions of interest.--*Aphelenchoides fragariae* (Ritzema Bos) Christie was intercepted in *Iris alata* on September 21 and in *I. bucharica* on October 6 at the Washington Inspection House in shipments from Netherlands. *A. parietinus* Bastian and *Aphelenchus avenae* Bastian were intercepted at New York on October 20 in *Fritillaria imperialis* bulbs from Netherlands. *Colletotrichum orchidearum* All. was intercepted at San Francisco on November 26, 1937, on *Angraecum falcatum* in mail from Japan. This fungus has been intercepted on other genera of orchids. *Dendrodochium cattleyae* All. was intercepted September 1 at San Francisco on *Cattleya skinneri* from Guatemala. *Erysiphe polygoni* DC was intercepted on green string beans in baggage from Mexico on October 26 at El Paso. This mildew has been intercepted on peas from Mexico more or less frequently. Probably the weather is more favorable for its development during the pea season. *Fabraea maculata* (Lev.) Atk. was intercepted on quinces from Italy on September 29 and October 14 at New York. *Fusarium orchidis* Petch was intercepted on August 31 on *Oncidium splendidum* and *Gloeosporium cattleyae* P. Henn. on September 1 on *Cattleya skinneri* from Guatomala at San Fracisco. *G. dendrobii* Maubl. was intercepted on *Dendrobium taurinum* from the Philippines on May 19 and *G. odontoglossi* var. *macrospora* on *Odontoglossum crispum* from Colombia on August 27 and on *O. grande* from Guatemala on August 31 at San Francisco. *Heterodera marioni* (Cornu) Goodey was intercepted in shipments of *Freesia armstrongii* and *F. refracta* var. *chapmani* corms from Japan on September 5 and 6 at San Francisco. Mosaic symptoms on squash from Mexico intercepted on October 24 at El Paso were similar to those described for cucumber in Miscellaneous Publication 292, on market diseases of crucifers and cucurbits. *Physalospora camptospora* Sacc. was intercepted on shipments of *Stanhopea* sp. from Mexico on May 17 and 18 at San Francisco. *Puccinia shiraiana* Syd. was intercepted on August 31 at Buffalo on *Justicia procumberis* in mail from Japan.

DOMESTIC PLANT QUARANTINES

Padget in charge of white-fringed beetle project.--L. J. Padget has been designated as project leader in field charge of the white-fringed beetle control operations, with W. R. Heard as assistant. Mr. Padget has been acting in charge of the project for the last few months.

Grasshopper population surveyed.--The survey of the grasshopper population in States from the Mississippi Valley to the Pacific Coast has been completed and the results are being summarized for use at the conference of Federal and State workers on the control project to be held at Omaha on November 21 and 22. A report from the Oklahoma State Grasshopper Control Committee states: "We consider the 1938 grasshopper control program was very successful in Oklahoma. If it had not been for Federal assistance in the southwestern fourth of the State, the entire cotton crop would have been destroyed and much of the alfalfa seriously injured."

Mormon cricket control work.--Field operations for Mormon cricket control having been completed for the season, all equipment is being hauled and stored in Federal warehouses. Machines have been constructed and put in use for cleaning and straightening the metal strips, having a total length of several hundred miles, which were used as barriers against migration of the crickets.

White-fringed beetle control activities.--Inspectors making roadside inspections in October found light infestations of white-fringed beetles in Wilcox County, Ala., bordering on the north of the known infested county of Monroe in the same State. Most of the area in the vicinity of the new infestation is timberland. Inspections in September of the vicinity of known infested areas resulted in finding few new infestations except for the Monroeville, Ala., area, which was widened by several miles. Spraying, dusting, and clean-up work has been continued on the newly infested properties. The Alabama State quarantine was amended, effective October 20, to include the Monroeville area.

Observations as to habits of white-fringed beetle.--Inspectors examining roads and properties in the area at Monroeville, Ala., report the following observations: "The soil in this section of the State is sandy, and the slightest imprint on it can be noticed. While making inspections in this kind of soil, it was noticed that the white-fringed beetle in crossing the sand made a track that was quite distinct from any of the other insects. Also, by studying these tracks, the direction the beetle was going could be determined. In following out these tracks, quite a few beetles were found, and it is for this reason that this type of inspection is being used in some of the localities at this time." From Gulfport, Miss., comes the report that emergence-cage tests show that a few of the near-Naupactus species were still emerging in the period September 12-24. The heaviest recorded emergence consisted of 160 adults from 1 square yard at Saucier, Miss. Adult beetles were reported scarce during the period September 12-24 in most of the infested areas, with the exception of Monroeville, Ala., where large numbers were found daily.

Sweetpotato weevil activities at harvest time.--Eradication measures were emphasized in the October work on the sweetpotato weevil control project carried on in Alabama, Georgia, Mississippi, and Texas. Taking advantage of the harvest season, growers were urged to clean their fields immediately after gathering the crop. Fields have yielded 36 percent of the infestations found since the project was begun in July 1937, and seed beds 51 percent. It is, therefore, on these sources that the surveys and inspections which were continued in October were predicated. The work in Georgia and Texas was accelerated through the assignment of additional inspectors by these States. Wild-host plants in the vicinity of Mobile, Ala., are being eradicated by State-sponsored W. P. A. laborers. The results of the work of the last 15 months in Texas in especially encouraging. Of the 17 infestations found in 5 Texas counties in 1937, only 1 now appears to be active.

Phony peach control work in generally infected States.--In addition to control of the phony peach disease, which has been effected throughout the lightly infected States, as discussed in a previous issue of the News Letter, the project has experienced a very successful year in Georgia. All trees found diseased in the past field season are being removed. With the continued assistance of growers, many of whom are helping to eradicate the diseased trees, it is believed that excellent control will be effected in the commercial sections of that State. In Mississippi permission has been obtained to remove peach trees from an orchard once the largest in the State, having an original planting of 25,000 trees. The removal of the remaining 6,000 to 7,000 trees will mean the removal of the largest phony peach infestation in Mississippi. State regulatory measures are proving a vital factor in bringing about the control of this disease. A marked increase in phony trees was found in one Louisiana parish, however, which disclosed over 6,000 such trees this year, as compared with over 1,000 in 1937. Whether this enormous increase was due to the more intensive inspection in 1938 has not been determined.

More emergency relief funds for peach-tree-removal work.--Additional funds recently allotted from the emergency relief appropriation will make possible the hiring of some 1,000 additional relief employees from November through February for the control of the phony peach disease. In October, 400 such employees were engaged in the removal of diseased and abandoned peach trees in Alabama, Arizona, Arkansas, California, Colorado, Georgia, Louisiana, New Mexico, Tennessee, and Utah.

Nursery inspection for peach mosaic disease.--Of the 194 nurseries of which inspections of the environs and of the budwood-source environs were made during the last field season, it was found that mosaic trees were existing within the mile-radius of such nurseries and budwood sources in the case of 2 nurseries in Arizona, 11 in California, 2 in Colorado, 7 in New Mexico, 1 in Oklahoma, 14 in Texas, and 4 in Utah.

Transit-inspection activities.--In September interceptions were made in 12 cities of 365 apparent violations of the Japanese beetle, gypsy moth, and pink bollworm quarantines, which had been consigned to 40 States and Canada. In October, 361 violations were intercepted, including infringements of quarantines relating to the white pine blister rust and Mexican fruitfly. One shipment in violation of the Japanese beetle quarantine, consigned to the Panama Canal Zone, was intercepted and inspected at Pittsburgh. Fall nursery stock shipping was reported by inspectors at most of the stations to be unusually light.

Carriers cooperate in transit inspection.--An example of the excellent cooperation of transportation agencies was recently cited by New York inspectors in the case of an express carloader who, on checking a shipment handled after inspection hours, found it to be a violation. From the Pittsburgh station comes the comment that there has been a decided decrease in uncertified shipments accepted by both mail and express. "We have made it a part of our job," the inspector states, "to stop the acceptance of uncertified material offered for shipment at the Central Post Office and the express terminals visited on the tour of inspection. Our success has been made possible by the cooperation of the receiving clerks at the mail and express offices."

Citrus canker eradication stepped up.--Additional emergency relief funds recently allotted in Southern States permits employment of up to 160 additional laborers on this project, making a total of 245. The State of Texas is employing eight inspectors and the Federal government an equal number. Nurseries and dooryard trees in the citrus areas were inspected without finding canker. The finding of escaped *Citrus trifoliata* seedlings necessitates intensive foot-by-foot inspection of lands covered with weeds, bushes, and grass, and the laborers take keen interest in finding and destroying these small trees.

CONTROL INVESTIGATIONS

Developmental changes in intestine of first-instar armyworm.--In making blood smears from first- and second-instar larvae of the southern armyworm (*Prodenia eridania* Cram.), J. Franklin Yeager and Sam C. Munson, Beltsville, Md., have noted that large epithelial cells from the larval midgut tend to appear in the smears in large numbers and usually isolated or as groups of two or three cells. In the early part of the first instar, the smeared gut cells are similar in form to those of the midgut in the embryo of this insect; but, later in the first instar, the smeared cells are similar to those of the other larval instars. This indicates that a transformation from an embryonic to a larval type of midgut epithelium occurs in the southern armyworm while it is in the first instar. This transformation usually occurs after the newly hatched larva begins to feed.

INSECTICIDE INVESTIGATIONS

Magnesium arsenates.--Information concerning the chemistry and insecticidal value of the various magnesium arsenates has been assembled by F. E. Dearborn and published as mimeographed publication E-451. Magnesium arsenate has been tested against about 30 species of insects. One hundred and sixty-one references to the literature are cited.

Toxicity of commercial phenothiazine to certain insects.--L. E. Smith has reported (Jour. Econ. Ent., vol. 31, no. 5, p. 631, October 1938) that commercial phenothiazine contains more or less material insoluble in ether. This insoluble material is practically inert as an insecticide, whereas the ether-soluble part is highly toxic.

Water extract of pyrethrum is not insecticidal.--M. S. Schechter and H. L. Haller have reported (Soap, vol. 14, no. 11, pp. 101, 103, November 1938) that, although aqueous extracts of pyrethrum flowers are toxic to goldfish, they are not toxic to the housefly. The flowers lose about one-third of their weight when extracted by water.

Preparation of peat for making nicotine peat.--In order to prepare the new insecticides, nicotine peat and nicotine humate, it is necessary to remove from the peat the inorganic base-forming elements that occur chemically combined as solids of the organic acids present. This removal is accomplished by treatment with acids. A practical process for carrying out this procedure on a commercial scale has been described by L. N. Markwood (Ind. Eng. Chem., Ind. Ed., vol. 30, no. 10, p. 1199, Oct. 1938).

BEE CULTURE

Nectarless nectar-producing plants.--Geo. H. Vansell, of the Pacific States Bee Culture Laboratory, Davis, Calif., recently reported a peculiar condition found this season in the vicinity of Ontario, Oreg., and the adjacent valley sections. He says: "I had frequently heard of alfalfa being purple with blossoms, yet the bees being unable to do anything on it. I had previously supposed this might be a condition of the bees; however, this is not the case. The bees were in producing condition, as evidenced by examination, yet they were not obtaining honey. I have never seen more alfalfa in the blossoming condition than was present all around Ontario. Some of the honey producers had been feeding until recently, feeding having been stopped not because the flow started but because of the expense involved. The bees were hanging around the hives except during the early morning hours when the rush for corn pollen was on. Not only was alfalfa available in this area but also sweetclover, yellow and white, and ladino. This was by far the best looking area visited, yet it was the poorest one for honey production so far this year." Such conditions are of frequent occurrence outside the irrigated sections and present some of the most baffling of the problems connected with nectar secretion. Thus, alfalfa, a major honey-producing plant in irrigated regions, ranks low as a nectar producer east of the Mississippi, although it blooms profusely. Weather conditions have been commonly ascribed as the governing factors for this phenomenon on the assumption that the plant requires dry weather but plenty of soil moisture to secrete freely. As a matter of fact, Vansell reports that the rainfall for the year in the region in which his observations were made has been above normal and that an excessive heat wave occurred during the third week in July.

IDENTIFICATION AND CLASSIFICATION OF INSECTS

Unusual structure in a species of Bruchus.--H. S. Barber notes that a peculiarity of Bruchus brachialis Fahreus, not yet observed in any of the several similar species examined, is often useful in the identification of fragmentary specimens. Observations on its functions are desired. In the male the connecting membrane behind the front coxae contains a brownish invaginated "pocket" which, when the specimen is distended by osmosis, evaginates into a crooked finger-like papilla, the apical and posterior surface of which seems to be very desnely but microscopically pubescent. Absence of such sensory, or otherwise functional, development in the several other species of bruchids examined for this structure makes this characteristic of special interest, but the role it may play is unknown. Living specimens observed under natural conditions of courtship, probably in the flowers of the host plant, and proper histological research, might suggest the function of the structure.

Collection of coleopterous larvae from Denmark.--A. G. Böving has received for the collections of the National Museum about 100 vials containing immature stages of Coleoptera occurring in Denmark. The material which is authentically identified, and in some cases was definitely associated with adults through rearing, was forwarded by J. P. Kryger of Gentofte, Denmark. Included in the lot are some forms not previously represented in the collection of the National Museum. Many of the items are accompanied by notes on larval habits.

Invasion of houses by certain outdoor weevils.--*Trachyphloeus bifoveolatus* Beck, a European species, which has been previously recorded from only two or three localities in the eastern United States, was recently found in abundance on the porches of houses, and to a lesser extent indoors also at Portland, Oreg., according to notes accompanying material submitted for determination. A somewhat similar case is that of the introduced Japanese weevil, *Calomycterus setarius* Roel., which occurred by the thousands on and in a house at Towson, Md., in 1935. The invasion of houses by certain species of Rhynchophora which normally live out-of-doors is usually sporadic and at times probably fortuitous, but in the case of *Brachyrhinus ovatus* L. the entering of buildings seems to be almost habitual, as every summer from several to many instances are reported of this species being found in houses, sometimes in large numbers. The combination of heat and drought appears to be one of the factors inducing such invasions, although doubtless there are various other causes differing according to circumstances and species. So far as known, all the species of weevils that enter houses more or less frequently, or in large numbers, are wingless.

A European muscid recorded from United States.--Two specimens, determined by D. G. Hall as Muscina pabulorum (Fall.), a relatively uncommon European species, were collected during the past fall in the vicinity of Boston, Mass., by Richard Dow, Curator, Boston Society of Natural History, who forwarded them to the Division of Insect Identification. This is the first North American record for the species. It will be recalled that *Muscina pascuorum* (Mg.), another European species, was first reported from Massachusetts in 1923. This species has become generally established in northeastern North America. So far as known, all of the species of *Muscina* are saprophytic. The larvae feed on decaying fruits and vegetation.

Distribution of tick parasite Ixodiphagus texanus.--The parasite *I. texanus* Howard was described in 1907 from Texas as a parasite of the rabbit tick (*Ixodes*) *Haemaphysalis leporis-palustris* (Packard) and redescribed by Gahan in 1934 from specimens the exact source of which could not be definitely determined. Up to the present time the species has been reported from Texas by Howard (1907) and again by Bishopp (1934), from Idaho by Cooley (1934), and from Minnesota by Larson (1937). A recent consignment to the Division of Identification sent in by C. N. Smith, of the Division of Insects Affecting Man and Animals, consisted of numerous specimens reared at Vineyard Haven, Mass., in September 1938 from nymphs of the rabbit tick. These have been identified by A. B. Gahan as *Ixodiphagus texanus* and indicate that this species is much more widespread than has previously been supposed.

Identifications of intercepted ants from Guam.--M. R. Smith has determined 13 species of ants taken by R. G. Oakley on Guam from the Hawaii, China, and Philippine clippers flying between California, Guam, Midway, Wake, the Philippine Islands, and China. Eight of these species represent some of the world's most important ant pests: *Pheidole megacephala* (Fabr.), *Iridomyrmex humilis* Mayr, *Monomorium destructor* (Jerd.), *Tetramorium guineense* (Fabr.), *Paratrechina longicornis* (Latr.), *Monomorium floricola* (Jerd.), *Solenopsis geminata* subsp. *rufa* (Jerd.) and *Plagiolepis longipes* (Jerd.). The first mentioned species was collected most often, being represented by all castes except queens.

An unusual cynipoid reared from aphids.--Clyde F. Smith, of Ohio State University, who has become conducting investigations on aphid parasites, recently submitted for determination a large quantity of material comprising parasites and hyperparasites that had been reared from various species of aphids, principally in Ohio and Utah. Included were many specimens of both sexes, from the two areas mentioned, of a cynipoid that has been identified by L. H. Weld as *Lytoxysta brevipalpis* Kieffer. This species, which was described from Fayetteville, Ark., and Forest Hills, Mass., has been known only in the female sex. A description of the male will be published by Mr. Weld from the abundant material reared by Mr. Smith. The male of *L. brevipalpis* is remarkable in having the same number of antennal segments as the female (13), and in this respect appears to represent an exception among the known Cynipoidea.

Further records for two introduced European sawflies.--An additional distribution record for *Diprion frutetorum* (F.), previously reported from the Niagara region and New Jersey, is Petersham, Mass., where it was taken under trees of *Pinus resinosa* on July 15, July 17, and August 1, 1938. The specimens were received from R. C. Brown, of the northeastern forest-insect laboratory. *Neodiprion sertifer* (Geoff.), another European sawfly, has been reported by J. S. Houser as a serious pest of *Pinus silvestris* in Ohio. This species has also been taken on *Pinus silvestris* and *P. resinosa* in New Jersey. The latter host shows that the sawfly is attacking native pines as well as the introduced species, *P. silvestris* and *P. mughus*.

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